EPRI Assessment of Fuel Cell R&D Needs

Daniel M. Rastler
(415-855-2521; Fax: 415-855-8501; E-mail: drastler@epri.com)
Electric Power Research Institute
3412 Hillview Avenue, P.O. Box 10412
Palo Alto, CA 94303

PAFC Needs

- Higher stack power density to reduce cost.
- Added electrolyte inventory or reduced electrolyte loss to ensure long cell stack life.
- Continued reduction in separator plate costs.
- Advanced water treatment system.
- Improved cooling system reliability.

MCFC Needs

- Alternative separator plate material to eliminate corrosion and reduce cost.
- Eliminate electrolyte migration in external manifold MCFC design.
- Creep resistant electrodes.
- Alternative electrolytes may reduce corrosion.
- Eliminate or simplify aluminization.
- Eliminate or simplify nickel coating.

SOFC Needs

- Establish a major DOE-supported planar SOFC program.
- Develop techniques to scale-up SOFC cells to larger sizes to reduce costs.
- Sulfur tolerant anodes.
- Improved conductivity metal interconnectors.
- Improved seals for metal interconnectors.
- Improved seals for external manifolds.
- System development.
- Improved, reduced temperature electrolytes.

PEM Fuel Cells

- Lower cost membrane.
- Higher temperature membrane (250 - 300 °F).
- Improve membrane tolerance to diffusion of methanol.
- CO tolerant anode catalyst.
- Improved membrane water tolerance to dry out.
- Improved fuel processing systems.
- Inexpensive separator plates.